

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8533 (1977): General Purpose Carabiners for Mountaineering [PGD 27: Mountaineering Equipment]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



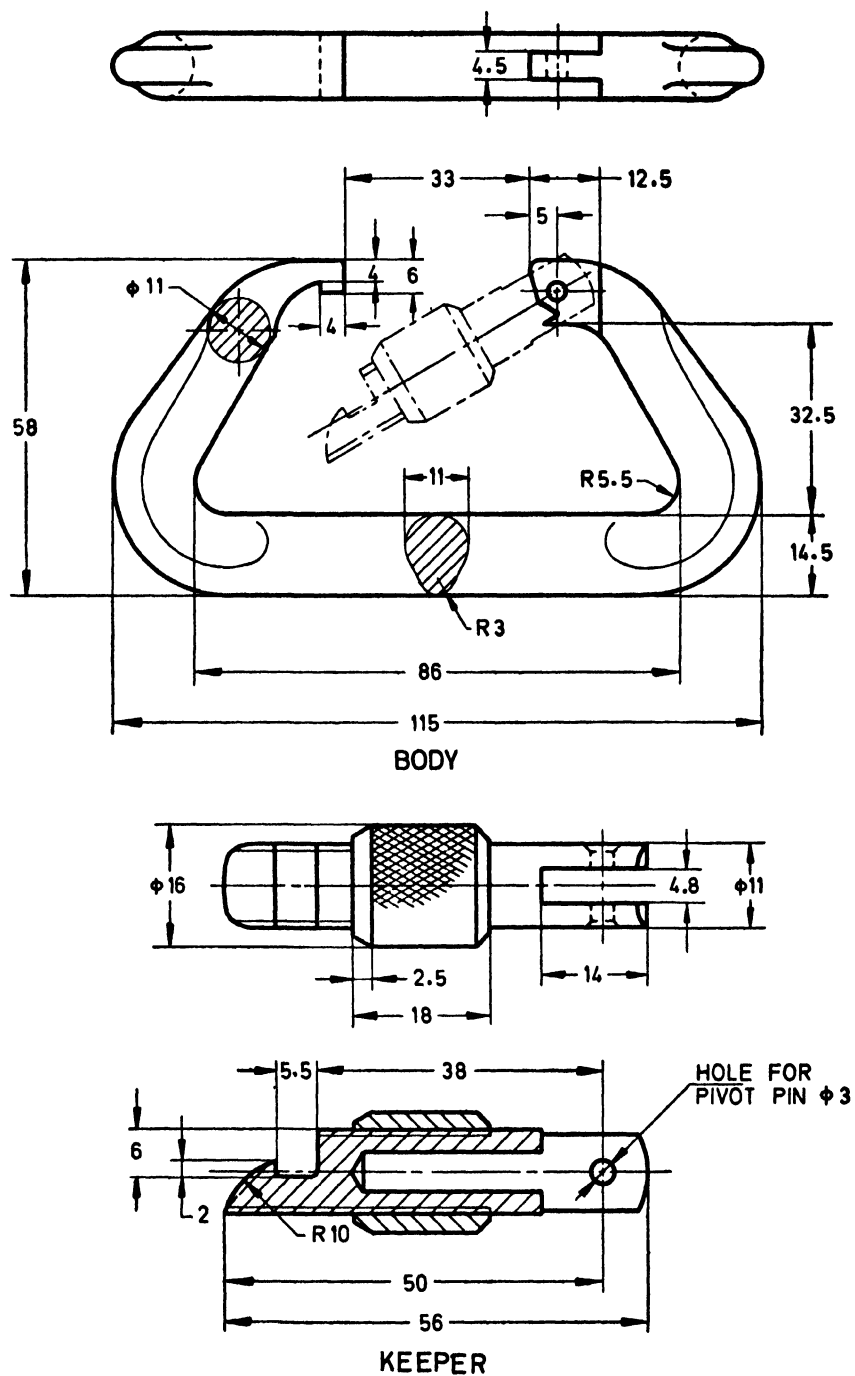
“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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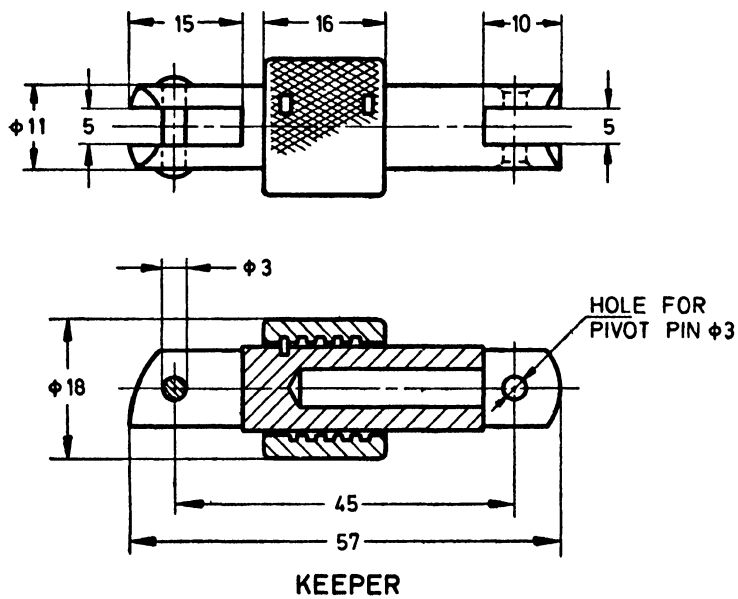
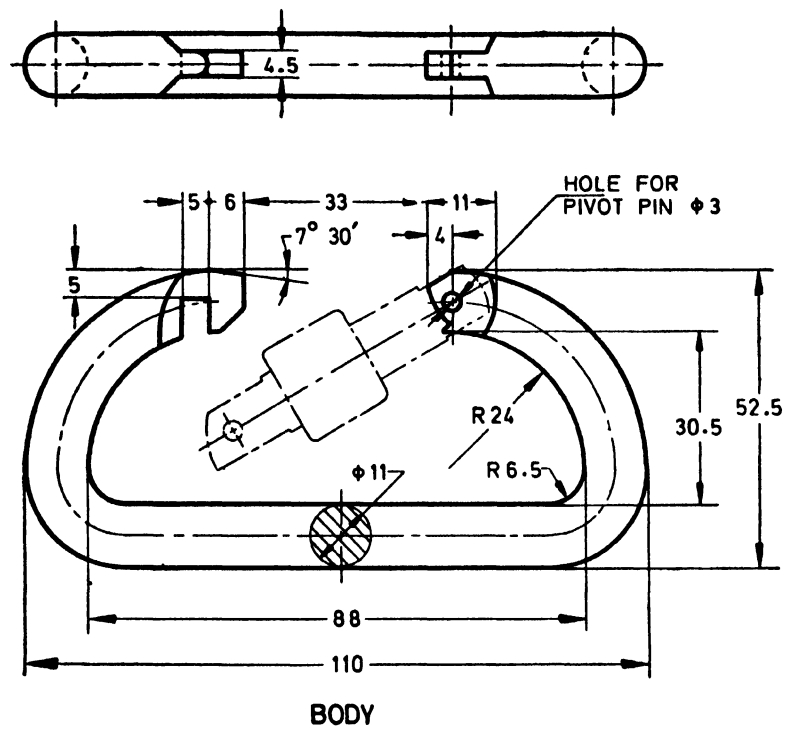




Note — Dimensions of spring and bit to suit the carabiner.

All dimensions in millimetres.

FIG. 2 DIMENSIONS FOR CARABINERS, TYPE A



Note — Dimensions of spring and bit to suit the carabiner.

All dimensions in millimetres.

FIG. 3 DIMENSIONS FOR CARABINER, TYPE B

5. Hardness

<i>Component</i>	<i>Hardness</i>
Pin (if made from steel)	200 to 250 <i>HV</i>
Spring	425 to 525 <i>HV</i>

6. Mass

<i>Type</i>	<i>Mass, Max</i>
	g
Carabiner, Type A	82
Carabiner, Type B	68

7. Design

7.1 Carabiners shall be so designed as to provide for the safe retention of, and to permit the ready insertion and removal of, climbing ropes not less than 12 mm in diameter. They shall accommodate not less than two such ropes at each end without restricting the freedom of the keeper. The opening through which the rope passes shall preferably be 18 mm, but not less than 15 mm in any case.

7.2 Generally the carabiners are of oval or 'D' shaped, even though modified designs of the same are also used.

7.3 Carabiners should always have a spring loaded keeper. On some designs, the keeper may be further locked by threaded bush.

8. Workmanship and Finish

8.1 Carabiners shall be free from sharp edges or other formations likely to damage a climbing rope or injure the user. The radius of parts of the carabiner with which a rope under load is in contact shall be not less than 5 mm.

8.2 Carabiners shall be given anodic coating to Grade AC15 of IS:1868-1968 'Specification for anodic coating on aluminium.'

8.3 The pivot-pin shall be rivetted flush on both ends.

8.4 The spring for the keeper shall have both ends square with axes.

8.5 The carabiners shall be free from cracks, pits, burrs, etc, likely to cause damage or injury to the climbing rope or user.

8.6 The keeper shall operate smoothly and shall not stick in the open position and lock properly when released.

9. Tests

9.1 Proof Load Test — Each carabiner shall have a tensile strength in the direction of its major and minor axis sufficient to withstand the loads which may be encountered in use. Static strength tests shall be made with the keeper open and closed by the normal methods used for measuring the static strength of metals, if possible with a machine which records load-extension diagrams. Details of the test procedure are given in Appendix A.

9.1.1 The minimum values obtained by tests shall be as follows:

a) *Load In Direction of Major Axis*

1) *Keeper open*

- i) 11 kN ($\approx$ 1 100 kgf) — After the test, the keeper shall lock properly the latch.
- ii) 12 kN ($\approx$ 1 200 kgf) — The maximum recorded load during test.

2) Keeper closed

i) 14 kN ($\approx 1\,400$ kgf) — No significant permanent deformation (safe working load or design load).

ii) 22.2 kN ($\approx 2\,220$ kgf) — The maximum recorded load during test.

b) Load in Direction of Minor Axis, Keeper Closed

6 kN (≈ 600 kgf) — The keeper should not open.

9.1.2 The proof-load test values specified above shall be applicable to all sizes and shapes of carabiners whether provided with a locking arrangement or not. While conducting the test, the threaded bush shall be in the unlocked position.

9.2 Impact Strength Test — The purpose of this test is to define an adequate degree of ductility in the carabiner in order to ensure that it should prove satisfactory in all mountaineering conditions. When three specimens are tested at room temperature and three at 30°C on a pendulum impact testing machine similar to that described in Appendix B, the energy absorption of the test specimens shall be not less than the following in any case:

a) 225 N.m (≈ 22.5 kgf.m) for all carabiners made from steel, or

b) 110 N.m (≈ 11.0 kgf.m) for all carabiners made from aluminium alloy.

9.2.1 The impact strength test values specified above shall be applicable to all the sizes and shapes of carabiners whether provided with a locking arrangement or not.

9.3 Test for Spring — The keeper of the carabiner shall be fully opened and released 200 times. After completion of test, the spring fitted inside the keeper shall not take a permanent set in that the keeper shall function efficiently and spring back without striking or jamming as soon as it is released from the open position at the conclusion of this test.

9.4 Crack Test — Each carabiner shall be subjected to crack detection test.

10. Marking — Each carabiner shall be suitably embossed during forging or marked with acid etching with the manufacturer's name and the guaranteed maximum load in the direction of the major axis with keeper closed [which in all cases shall be not less than 22 kN ($\approx 2\,200$ kgf)]. The marking shall be applied in such a way as not to impair the performance of the carabiner.

10.1 ISI Certification Marking — Details available with the Indian Standards Institution.

11. Declaration by the Supplier — The supplier shall make a declaration regarding the quality of carabiners being quoted or supplied, in the form as given in Appendix C.

APPENDIX A

(Clause 9.1)

METHOD OF PROOF LOAD TEST

A-1. Load in Direction of Major Axis — The load shall be applied directly to the carabiners by means of two vertical links which are arranged to be perpendicular to the major axis. These vertical links shall be of such hardness that they are not significantly deformed during the test. It is important that the carabiners shall be free to locate itself on the vertical links as the load is applied; a universal joint in one arm of the testing machine is useful and the vertical link shall be well coated with a molybdenum based grease. In all 'keeper open' tests a well lubricated contact between vertical links and carabiner is essential in order to avoid false load readings caused by stick-slip action between the vertical link and the carabiner.

A-2. Load in Direction of Minor Axis — The load shall be applied to the mid-point of the keeper and the equivalent point on the spine defined by the minor axis. The mid-point of the keeper is the mid-point between the axis of the hinge link and the point of contact between keeper and latch. Any convenient diameter of loading vertical link may be used (as this does not influence the results) provided the location is maintained. In order to locate the loading vertical link during the test, grooves or slots may have to be made in the keeper and on the spine. Failures from such a groove or slot at a load less than the minimum specified will be taken as nullifying the test.

APPENDIX B

(Clause 9.2)

METHOD OF IMPACT STRENGTH TEST

B-1. A standard charpy pendulum impact machine is modified for this work. The hammer head is modified so that each carabiner under test is located by two links. The forward link is rigidly attached to the hammer. The rearward link is adjustable and located against the carabiner, the link lying at the centre of the percussion. This link strikes two rigid faces, lying in the same plane. In order to correct for the varying length of carabiner, different length of the pad carrying and impacting faces are used. Each carabiner is allowed to locate itself on the links with keeper closed, so the links load the points where the rope would tie in normal use and in the direction of the major axis. The machine is initially of about 300 N.m (≈ 30 kgf.m) striking energy and the modifications to the hammer head will normally produce a total mean striking energy of about 330 N.m (≈ 33 kgf.m) (including an allowance for the mass of the carabiner).

APPENDIX C

(Clause 11)

FORM OF DECLARATION BY THE SUPPLIER TO BE GIVEN WITH QUOTATION OR SUPPLY

C-1. The following information shall be given by the supplier at the time of quotation or supply:

- a) Dimensions of carabiner,
- b) Mass of each carabiner,
- c) Material of manufacture (indicate number of relevant standard),
- d) Details of heat treatment,
- e) Declared value of tensile strength and impact strength (when tested according to this standard),
- f) Protective treatment against corrosion, and
- g) Number of this standard.

EXPLANATORY NOTE

This standard is based on ' UIAA Agreement on approval of general purpose snap-links ' issued by the International Des Associations d' alpinisme, Switzerland.

Although mass of the two types of carabiners has been laid down in the standard, every effort should be made to reduce the mass of carabiners as much as possible while maintaining the strength.